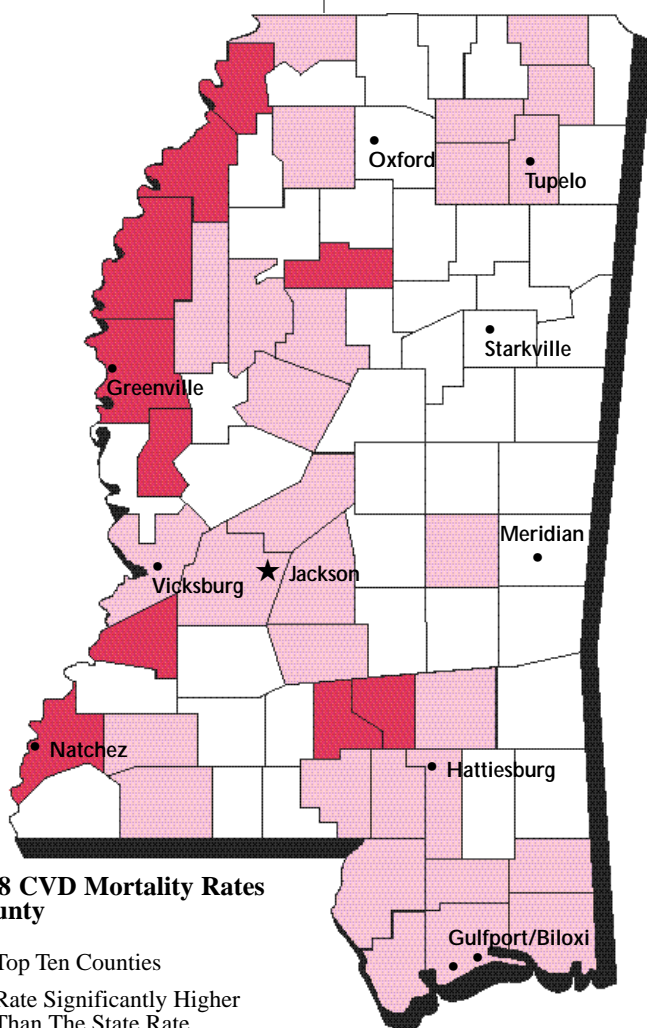


# 2000 Mississippi State Of The Heart Report

Statistics For Cardiovascular Diseases  
In Mississippi Including  
County-By-County Mortality



*Cardiovascular disease (CVD), including heart disease and stroke, is the leading cause of death across the state. More Mississippians die each year from CVD than from all types of cancer, traffic injuries, suicides, and AIDS combined.*

See pages 8 - 9 for complete county mortality data in Mississippi.

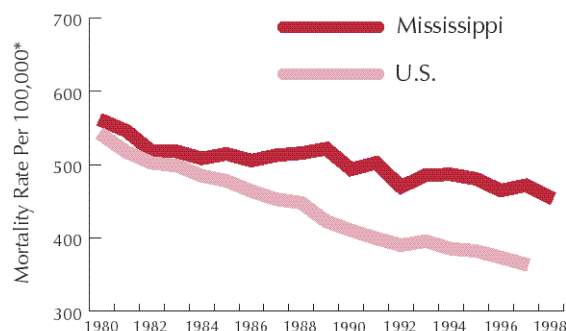
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MISSISSIPPI STATE DEPARTMENT OF HEALTH

“Between 1980 and 1997, CVD death rates for the U.S. as a whole declined by 33%, an average of 2.3% per year. In contrast, Mississippi’s CVD death rate declined by only 16% over the same period, an average of 0.8% per year.”

**CVD Mortality Rates By Year  
Mississippi And The U. S., 1980-98**



\* age adjusted to the 2000 U.S. population

1998 U.S. rate not available at time of writing

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Office of Community Health Services & Bureau of Public Health Statistics
- **American Heart Association, Southeast Affiliate.**

## Useful Web Sites

- AHA: <http://www.amhrt.org> or <http://www.americanheart.org/>
- Mississippi State Department of Health:: <http://www.msdh.state.ms.us>
- NHLBI: <http://www.nhlbi.nih.gov/>
- NHLBI Report of the Workshop on Research in Coronary Heart Disease in Blacks: [http://www.nhlbi.nih.gov/health/prof/heart/other/r\\_chdbl.htm](http://www.nhlbi.nih.gov/health/prof/heart/other/r_chdbl.htm)
- Mortality data: <http://wonder.cdc.gov>
- BRFSS: <http://www.cdc.gov/nccdphp/brfss>

## For Further Information

If you would like more information on this report  
or on the two organizations contact —

American Heart Association  
Southeast Affiliate  
1685 Terrell Mill Road SE  
Marietta, Georgia 30067  
770/952-1316  
Internet: [www.amhrt.org](http://www.amhrt.org)

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Mississippi State Department of Health  
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Post Office Box 1700  
Jackson, Mississippi 39215-1700  
601/576-7725  
Internet: [www.msdh.state.ms.us](http://www.msdh.state.ms.us)



# Executive Summary

- Cardiovascular disease (CVD) (principally heart disease and stroke) is the leading cause of death in Mississippi, accounting for 43% of all deaths in 1998
- In 1998, 11,845 Mississippians died from CVD
  - 6,279 deaths among women and 5,566 deaths among men
  - 7,917 deaths among whites and 3,928 deaths among African Americans
- CVD is responsible for a considerable amount of premature mortality: in 1998, one in five CVD deaths occurred in Mississippians under 65 years of age
- African Americans have higher CVD death rates than whites, and men have higher rates than women
- In 1998, rates were 25% higher for African American men than white men, and 32% higher for African American women than white women
- Mississippi's CVD mortality rate is the highest in the nation, with a mortality rate in 1997 that was 30% higher than the rate for the U.S. as a whole
- CVD death rates in Mississippi are falling, but not as much as rates in the rest of the nation: CVD mortality rates for the U.S. are declining almost three times as fast as rates in Mississippi
- African American males and females in Mississippi have maintained more or less level CVD mortality rates since the early 1980s, resulting in a growing disparity in CVD mortality rates between whites and African Americans in the state.
- CVD mortality rates show a wide variation from county to county; this is largely the result of environmental influences (social, economic, and cultural factors) on the incidence of, and mortality from, CVD
- Twenty-nine counties had CVD mortality rates in 1996-98 that have actually increased compared to 1993-95
- Three-quarters of Mississippians have at least one CVD risk factor (smoking, high blood pressure, high blood cholesterol levels, being overweight/obese, and lack of regular physical activity)
- Further decreases in the CVD mortality rates will not be achieved unless racial/ethnic and geographic disparities are reduced
- To reduce the prevalence of CVD risk factors in the population more Mississippians need to stop smoking, become more active, lose weight, control their blood pressure, eat a healthier diet, and lower their blood cholesterol level. This prevention must start at an early age, since the processes that lead to CVD in middle or old age begin in childhood
- Much of the death, illness, and disability due to CVD is preventable, but it will not be prevented without population-wide actions by individuals, schools, communities, and workplaces working together to create 'heart-healthy' environments, policies, & norms



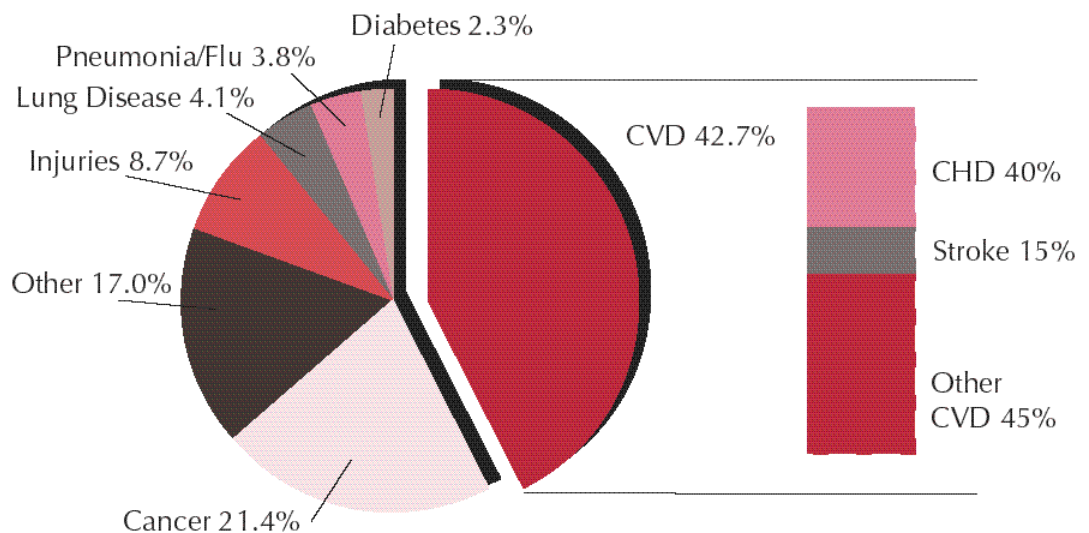
# Introduction

In this report, cardiovascular disease (CVD) comprises heart disease, stroke, complications of hypertension (high blood pressure), and diseases of the arterial blood vessels. It results from thickening and narrowing of the arterial blood vessels, a process called atherosclerosis, which begins in childhood and progresses over a lifetime. CVD is the leading cause of death in Mississippi, accounting for 11,845 deaths in the state in 1998, which is 43% of all deaths (Figure 3). No other single category accounts for as many deaths. Although commonly thought of as a condition of old age, CVD is responsible for a considerable amount of premature mortality, here defined as death before age 65. It is

also believed to be a leading cause of morbidity and disability, although state-specific data to support this are unavailable.

Coronary heart disease (CHD) — also known as ischemic heart disease (IHD) — and stroke are the two most common forms of CVD, together accounting for 6,553 deaths (55% of all CVD deaths) in Mississippi in 1998. Although coronary heart disease and stroke share many risk factors, and the conditions coexist in many people, the two have different epidemiologic patterns and merit separate reports. This one will cover CVD in general and coronary heart disease specifically; a separate report, to be published in the Fall of 2000, will cover stroke.

**Figure 1 - Leading Causes Of Death  
In Mississippi, 1998**



# Cardiovascular Disease (CVD) In Mississippi

Mississippi's CVD mortality rate is, and has been for many years, the highest in the nation (data not shown). In 1997 (the latest year for which comparable national data are available), Mississippi's CVD mortality rate was 30% higher than the rate for the U.S. as a whole (Table 1).

CVD death rates differ by racial/ethnic group, gender, and age group. African Americans have higher rates than whites, and men have higher rates than women. In 1998, rates were 25% higher for African American men than white men, and 32% higher for African American women than white women (Figure 2). The exact reasons for these disparities are unknown.

**Table 1 - CVD And CHD Mortality Rates**

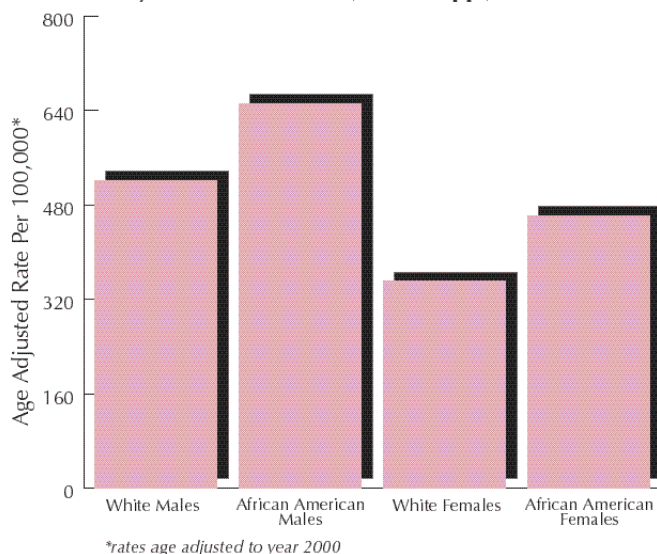
| 1997        | CVD Mortality Rate/100,000* | CHD Mortality Rate/100,000* |
|-------------|-----------------------------|-----------------------------|
| Mississippi | 472.0                       | 186.1                       |
| U.S.        | 364.2                       | 179.6                       |

**Mississippi And The U.S., 1997**

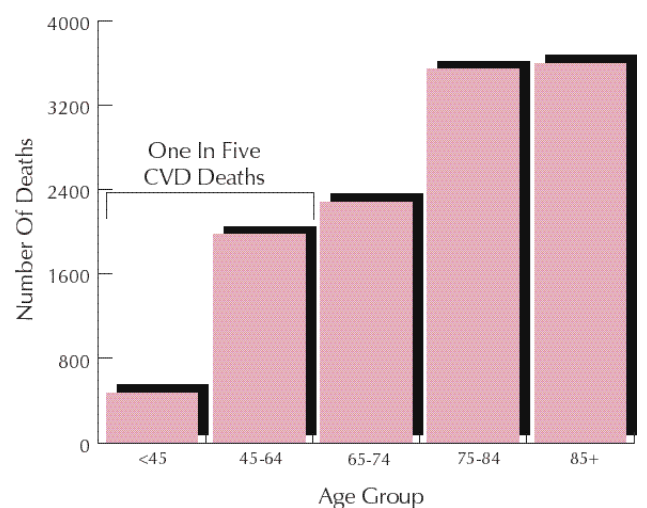
*\*age adjusted to the 2000 U.S. population*

CVD is uncommon before middle age; however, CVD death rates increase steadily and increasingly steeply thereafter. In 1998, one in five CVD deaths occurred in Mississippians under 65 years of age (Figure 3). This premature mortality due to CVD is greater for men than women and for African Americans than whites. The largest amount of premature CVD mortality occurs in African American men: 37% of all CVD deaths in this group occurred before age 65 (Figure 4).

**Figure 2 - CVD Mortality Rates  
By Race And Gender, Mississippi, 1998**



**Figure 3 - CVD Deaths By Age Group  
(all races, both genders), Mississippi, 1998**



In terms of absolute numbers of deaths, however, there are more CVD deaths in females than males because more women live to older

ages, when CVD is more common. In 1998, there were 6,279 CVD deaths among women and 5,566 CVD deaths among men (Figure 5).

Figure 4 - Premature CVD Deaths By Race And Gender, Mississippi, 1998

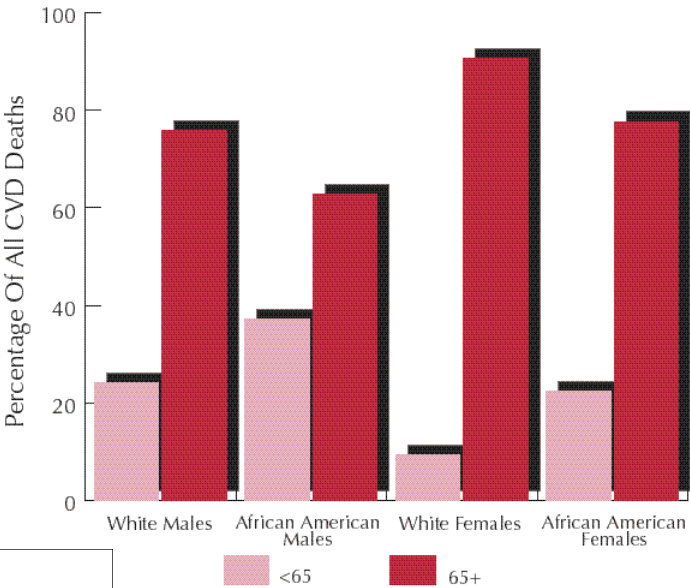
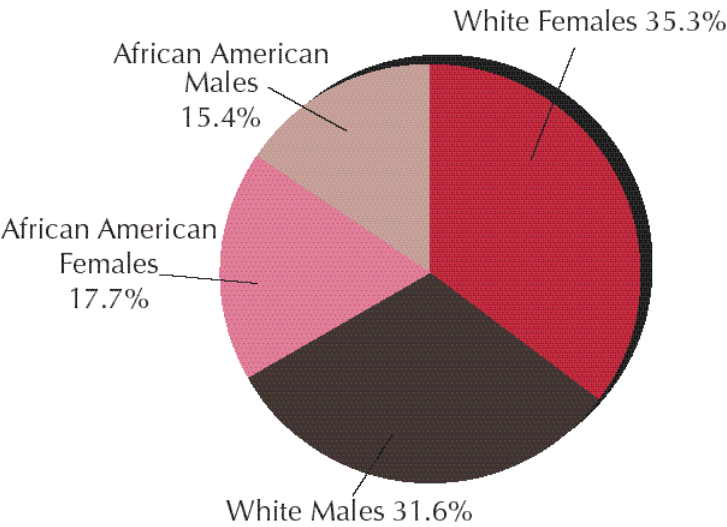


Figure 5 - Proportional Distribution Of CVD Deaths (all ages) By Race And Gender, Mississippi, 1998

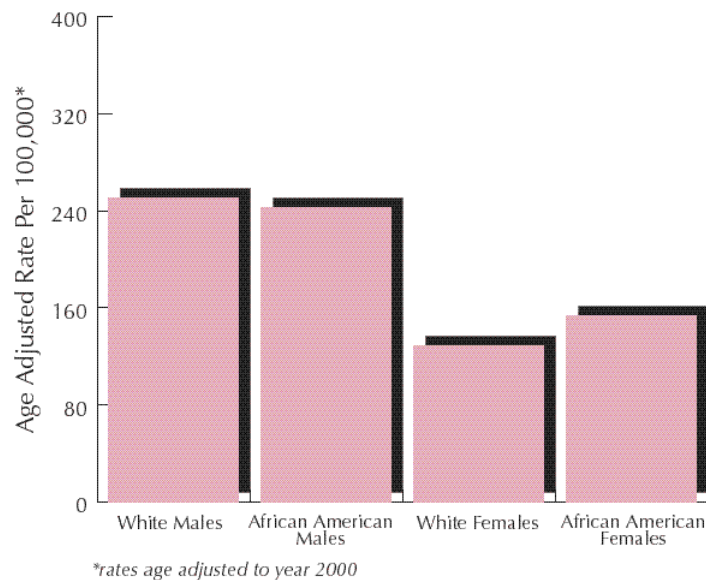


# Coronary Heart Disease (CHD) In Mississippi

Mississippi's CHD mortality rate also is higher than the U.S. rate (Table 1), and in 1997 the state had the 13th highest rate in the nation (data not shown). As with CVD, CHD death rates differ by racial/ethnic group, gender, and age group, though the differences are less marked than with overall CVD. African Americans have higher rates than whites, and men have higher

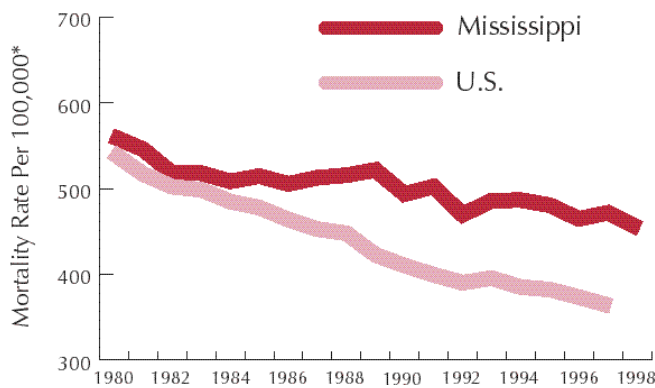
rates than women. In 1998, rates were 3% higher for white men than African American men (a reversal of the situation for CVD rates), and 20% higher for African American women than white women (Figure 6). As with CVD, CHD mortality rates vary by age group, and CHD accounts for considerable premature mortality (data not shown due to space limitations).

**Figure 6 - CHD Mortality Rates  
By Race And Gender, Mississippi, 1998**



# Trends In Cardiovascular Disease And Coronary Heart Disease In Mississippi

**Figure 7 - CVD Mortality Rates By Year Mississippi And The U. S., 1980-98**



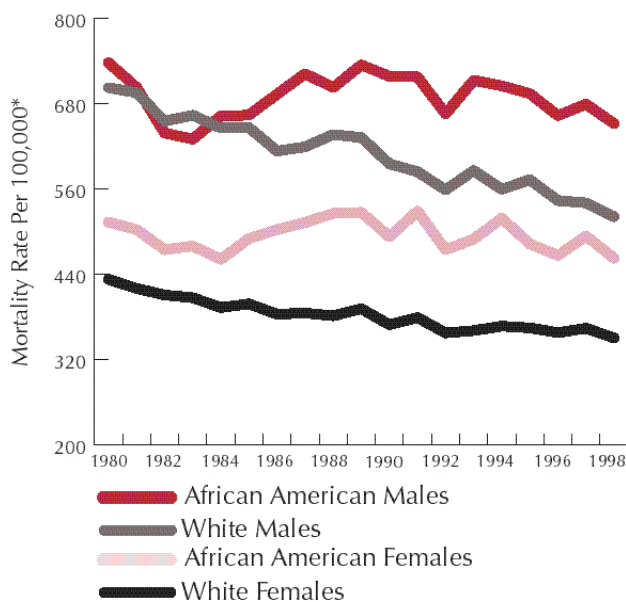
*\* age adjusted to the 2000 U.S. population*

*1998 U.S. rate not available at time of writing*

CVD death rates in Mississippi have not fallen as much as rates in the rest of the nation. Between 1980 and 1997, CVD death rates for the U.S. as a whole declined by 33%, an average of 2.3% per year. In contrast, Mississippi's CVD death rate declined by only 16% over the same period, an

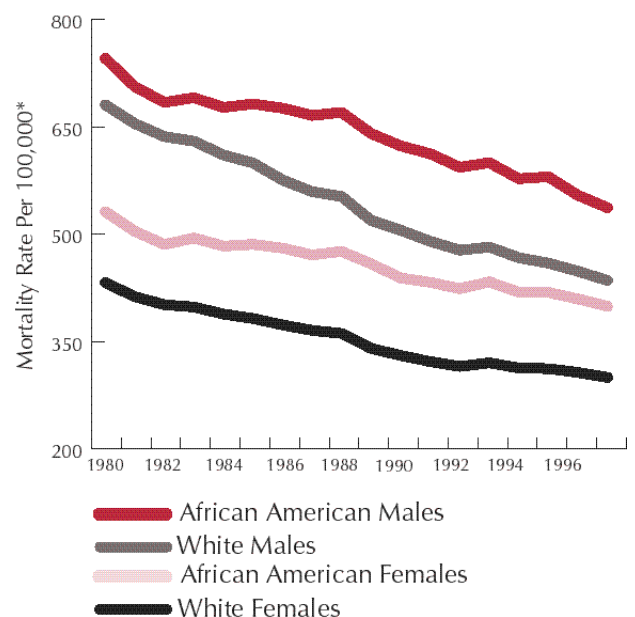
average of 0.8% per year. As a result, Mississippi's CVD mortality rate is now one third higher than that of the U.S., and the disparity is growing (Figure 7). Moreover, the decline of the rate in Mississippi is not the same in all population groups (Figure 8a). In contrast to African Americans in the rest of the U.S. (Figure 8b), African American males and females in Mississippi have maintained more or less level CVD mortality rates since the early 1980s, resulting in a growing disparity in CVD mortality rates between whites and African Americans in the state (Figure 8a).

**Figure 8a - CVD Mortality Rates By Year Mississippi, 1980-98**



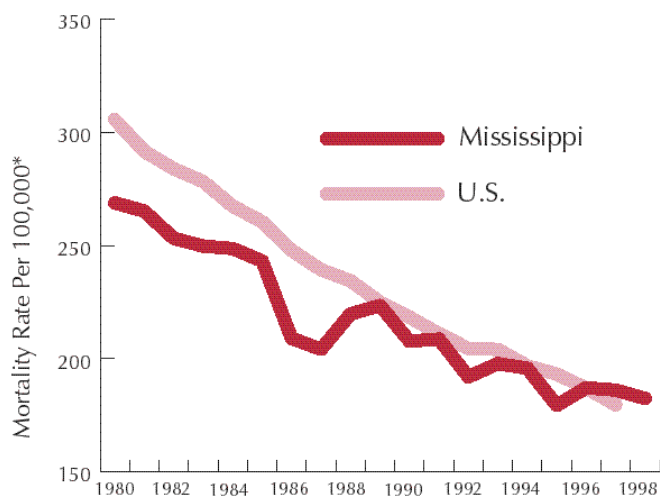
*\* age adjusted to the 2000 U.S. population*

**Figure 8b - CVD Mortality Rates By Year U.S., 1980-97**



*\* age adjusted to the 2000 U.S. population*

**Figure 9 - CHD Mortality Rates By Year  
Mississippi And The U. S., 1980-98**



\* age adjusted to the 2000 U.S. population

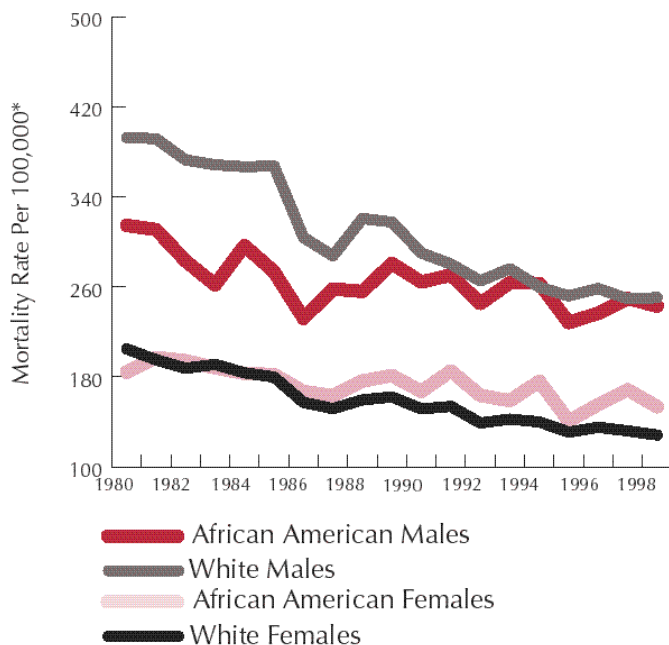
1998 U.S. rate not available at time of writing

The picture is similar with respect to coronary heart disease.

Mississippi had CHD mortality rates lower than the rest of the U.S. until the late 1980s. Since then the decline has continued but Mississippi has not kept pace with the rest of the nation. The gap has narrowed greatly until, in 1996, the

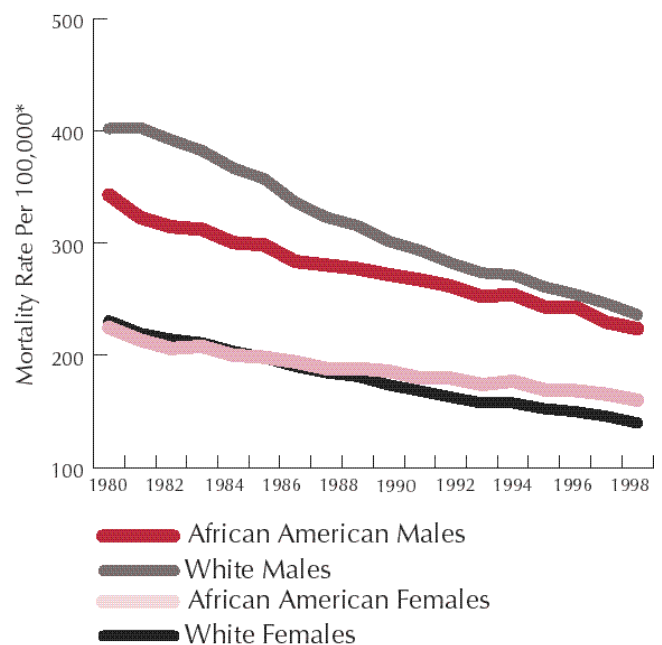
trend line for the U.S. dipped below that for Mississippi (Figure 9). This change is due largely to the failure of CHD mortality rates in African Americans in Mississippi to decline as fast as rates in whites. In 1980, Mississippi African American males had considerably lower CHD mortality rates than Mississippi white males; in the 1990s, the rates have been very similar (Figure 10a). In the early 1980s, Mississippi African American females had very similar CHD mortality rates to Mississippi white females; since 1986, the rates for Mississippi African American women have been higher and the disparity is growing (Figure 10a). In contrast, CHD mortality rates for the U.S. as a whole have continued to decline in all population groups, though the decline has been less steep in African Americans (Figure 10b).

**Figure 10a - CHD Mortality Rates By Year  
Mississippi, 1980-98**



\* age adjusted to the 2000 U.S. population

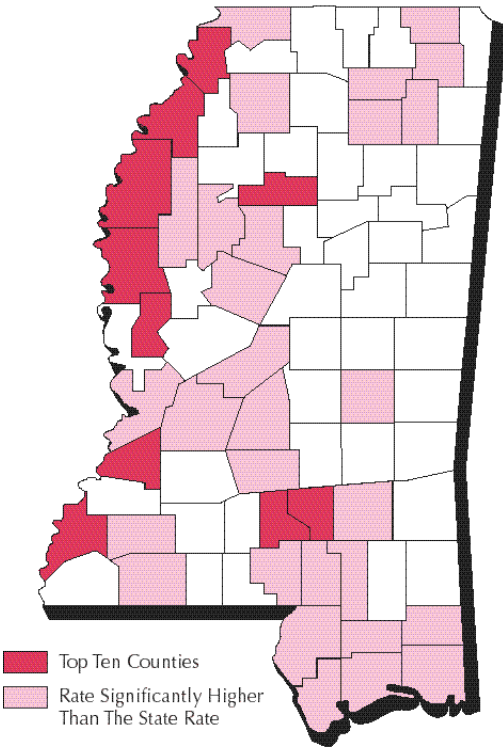
**Figure 10b - CHD Mortality Rates By Year  
U.S., 1980-97**



\* age adjusted to the 2000 U.S. population

# Cardiovascular Disease And Coronary Heart Disease Statistics By County

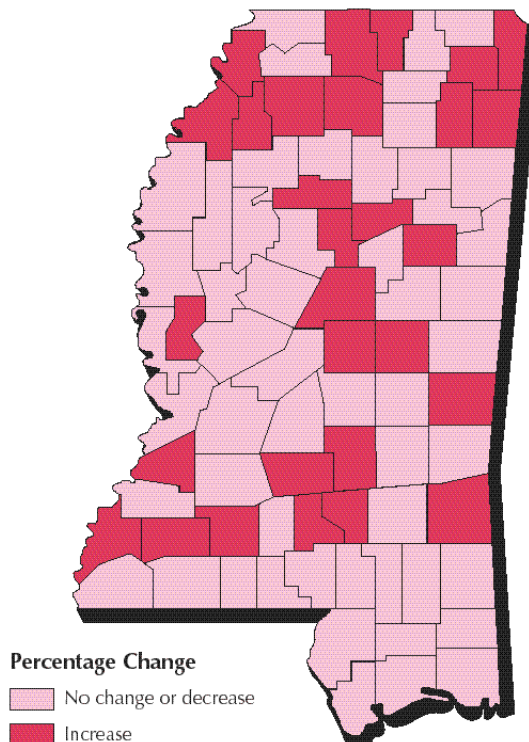
**Figure 11 - CVD Mortality Rates  
By County, 1996-98**



Age adjusted CVD mortality rates show a wide variation from county to county, ranging from 675.3 per 100,000 (Claiborne) to 307.9 per 100,000 (Amite), a difference of 119% (Figure 11 and Table 2). Claiborne county's rate is 46% above the state average. Twenty-one (21) of the state's 82 counties have CVD mortality rates that are statistically

significantly higher than the state's overall rate. The top ten counties with the highest CVD mortality rates are, in descending order, Claiborne, Covington, Tunica, Washington, Sharkey, Adams, Grenada, Jefferson Davis, Coahoma, and Bolivar. Such wide variation between counties is largely the result of environmental influences (social, economic, and cultural factors) on the incidence of, and mortality from, CVD, and emphasizes the need for prevention at all levels to reduce these differences. This becomes even more urgent when trend data are examined: compared to 1993-95, twenty-nine (29) counties — 8 of the

**Figure 12 - Percentage Change In CVD Mortality Rate  
By County, Mississippi, 1996-98 vs 1993-95**



top 10 plus 21 others — had CVD mortality rates in 1996-98 that actually increased, by up to 26% (Figure 12).

Table 2 - Cardiovascular Disease Death Rates By County

| County     | Cardiovascular Disease Deaths |                 |                              |                 |   |                                |  | Cancer Deaths          |                          |                                   |                 |                                  | CHD Deaths        |                              |
|------------|-------------------------------|-----------------|------------------------------|-----------------|---|--------------------------------|--|------------------------|--------------------------|-----------------------------------|-----------------|----------------------------------|-------------------|------------------------------|
|            | No. of CVD deaths             | % of all deaths | Age-adjd. death rate 1996-98 | Rate in top 10? | Stat. signif. different from state rate | Age-adjd. death rate 1993-1995 | % Change in death rate 96-98 vs. 93-95 | No. of CVD deaths Male | No. of CVD deaths Female | No. of deaths all forms of cancer | % of all deaths | No. of deaths from breast cancer | No. of CHD deaths | Age adjd. death rate 1996-98 |
| All MS     | 11,845                        | 42.7            | 461.3                        | n/a             | n/a                                     | 480.6                          | -4.0                                   | 5,566                  | 6,279                    | 5,944                             | 21.4            | 396                              | 4,749             | 184.1                        |
| Adams      | 224                           | 50.2            | 564.8                        | ✓ (6)           | ✓                                       | 528.7                          | 6.8                                    | 117                    | 107                      | 89                                | 20.0            | 11                               | 59                | 166.2                        |
| Alcorn     | 141                           | 36.6            | 419.8                        | ✗               | ✓                                       | 471.6                          | -11.0                                  | 67                     | 74                       | 75                                | 19.5            | 3                                | 49                | 146.7                        |
| Amite      | 39                            | 31.7            | 307.9                        | ✗               | ✓                                       | 451.9                          | -31.9                                  | 24                     | 15                       | 41                                | 33.3            | 2                                | 23                | 162.3                        |
| Attala     | 131                           | 42.8            | 511.1                        | ✗               | ✗                                       | 481.4                          | 6.2                                    | 63                     | 68                       | 69                                | 22.5            | 4                                | 62                | 267.1                        |
| Benton     | 50                            | 42.4            | 522.9                        | ✗               | ✗                                       | 495.6                          | 5.5                                    | 21                     | 29                       | 21                                | 17.8            | 0                                | 15                | 163.1                        |
| Bolivar    | 169                           | 41.1            | 552.4                        | ✓ (10)          | ✓                                       | 559.8                          | -1.3                                   | 78                     | 91                       | 85                                | 20.7            | 3                                | 51                | 155.5                        |
| Calhoun    | 94                            | 50.5            | 447.7                        | ✗               | ✗                                       | 486.4                          | -8.0                                   | 40                     | 54                       | 34                                | 18.3            | 3                                | 24                | 135.9                        |
| Carroll    | 43                            | 42.2            | 355.4                        | ✗               | ✓                                       | 356.6                          | -0.4                                   | 26                     | 17                       | 32                                | 31.4            | 3                                | 20                | 177.9                        |
| Chickasaw  | 82                            | 45.1            | 456.7                        | ✗               | ✗                                       | 491.2                          | -7.0                                   | 47                     | 35                       | 42                                | 23.1            | 2                                | 43                | 241.1                        |
| Choctaw    | 39                            | 45.9            | 403.3                        | ✗               | ✗                                       | 451.1                          | -10.6                                  | 14                     | 25                       | 25                                | 29.4            | 1                                | 11                | 82.6                         |
| Claiborne  | 62                            | 56.9            | 675.3                        | ✓ (1)           | ✓                                       | 642.2                          | 5.2                                    | 33                     | 29                       | 19                                | 17.4            | 1                                | 30                | 367.3                        |
| Clarke     | 90                            | 55.9            | 434.3                        | ✗               | ✗                                       | 559.6                          | -22.4                                  | 43                     | 47                       | 20                                | 12.4            | 3                                | 13                | 125.3                        |
| Clay       | 118                           | 48.8            | 503.5                        | ✗               | ✗                                       | 569.9                          | -11.7                                  | 54                     | 64                       | 45                                | 18.6            | 2                                | 60                | 259.5                        |
| Coahoma    | 147                           | 41.4            | 553.4                        | ✓ (9)           | ✓                                       | 527.5                          | 4.9                                    | 63                     | 84                       | 83                                | 23.4            | 5                                | 58                | 213.2                        |
| Copiah     | 122                           | 42.5            | 433.3                        | ✗               | ✗                                       | 475.0                          | -8.8                                   | 58                     | 64                       | 64                                | 22.3            | 6                                | 59                | 225.1                        |
| Covington  | 104                           | 45.2            | 585.3                        | ✓ (3)           | ✓                                       | 519.5                          | 12.7                                   | 64                     | 40                       | 55                                | 23.9            | 3                                | 21                | 145.5                        |
| Desoto     | 274                           | 40.7            | 404.7                        | ✗               | ✓                                       | 409.8                          | -1.2                                   | 135                    | 139                      | 164                               | 24.3            | 10                               | 121               | 179.1                        |
| Forrest    | 310                           | 43.8            | 495.1                        | ✗               | ✓                                       | 523.9                          | -5.5                                   | 130                    | 180                      | 166                               | 23.5            | 12                               | 118               | 197.5                        |
| Franklin   | 63                            | 50.0            | 550.2                        | ✗               | ✓                                       | 434.9                          | 26.5                                   | 18                     | 45                       | 28                                | 22.2            | 1                                | 18                | 136.5                        |
| George     | 51                            | 29.8            | 380.1                        | ✗               | ✓                                       | 440.5                          | -13.7                                  | 23                     | 28                       | 48                                | 28.1            | 5                                | 29                | 241.4                        |
| Greene     | 35                            | 39.3            | 417.0                        | ✗               | ✗                                       | 512.1                          | -18.6                                  | 15                     | 20                       | 21                                | 23.6            | 2                                | 14                | 199.0                        |
| Grenada    | 138                           | 49.6            | 559.0                        | ✓ (7)           | ✓                                       | 557.0                          | 0.4                                    | 68                     | 70                       | 49                                | 17.6            | 3                                | 37                | 160.9                        |
| Hancock    | 165                           | 40.3            | 398.3                        | ✗               | ✓                                       | 488.5                          | -18.5                                  | 85                     | 80                       | 90                                | 22.0            | 5                                | 72                | 169.0                        |
| Harrison   | 753                           | 43.0            | 495.2                        | ✗               | ✓                                       | 504.5                          | -1.8                                   | 370                    | 383                      | 407                               | 23.2            | 32                               | 413               | 281.9                        |
| Hinds      | 974                           | 39.5            | 443.9                        | ✗               | ✓                                       | 461.5                          | -3.8                                   | 430                    | 544                      | 562                               | 22.8            | 48                               | 257               | 113.7                        |
| Holmes     | 121                           | 44.5            | 526.6                        | ✗               | ✓                                       | 618.3                          | -14.8                                  | 57                     | 64                       | 47                                | 17.3            | 4                                | 27                | 150.9                        |
| Humphreys  | 41                            | 39.8            | 506.7                        | ✗               | ✗                                       | 523.5                          | -3.2                                   | 20                     | 21                       | 20                                | 19.4            | 2                                | 12                | 130.5                        |
| Issaquena  | 6                             | 54.5            | 427.3                        | ✗               | ✗                                       | 246.6                          | 73.2                                   | 4                      | 2                        | 1                                 | 9.1             | 0                                | 3                 | 116.7                        |
| Itawamba   | 124                           | 47.0            | 513.3                        | ✗               | ✗                                       | 449.2                          | 14.3                                   | 57                     | 67                       | 56                                | 21.2            | 9                                | 52                | 218.7                        |
| Jackson    | 431                           | 38.8            | 414.3                        | ✗               | ✓                                       | 457.6                          | -9.5                                   | 199                    | 232                      | 260                               | 23.4            | 10                               | 205               | 195.7                        |
| Jasper     | 85                            | 44.0            | 424.0                        | ✗               | ✗                                       | 467.3                          | -9.3                                   | 43                     | 42                       | 43                                | 22.3            | 1                                | 49                | 248.5                        |
| Jefferson  | 39                            | 39.0            | 497.2                        | ✗               | ✗                                       | 523.8                          | -5.1                                   | 17                     | 22                       | 18                                | 18.0            | 1                                | 11                | 126.4                        |
| Jeff Davis | 71                            | 50.0            | 555.3                        | ✓ (8)           | ✓                                       | 454.4                          | 22.2                                   | 33                     | 38                       | 31                                | 21.8            | 2                                | 14                | 106.8                        |
| Jones      | 259                           | 41.4            | 409.7                        | ✗               | ✓                                       | 450.4                          | -9.0                                   | 130                    | 129                      | 126                               | 20.2            | 8                                | 114               | 195.8                        |
| Kemper     | 45                            | 44.6            | 407.6                        | ✗               | ✗                                       | 410.5                          | -0.7                                   | 21                     | 24                       | 17                                | 16.8            | 0                                | 30                | 194.4                        |
| Lafayette  | 145                           | 45.5            | 423.0                        | ✗               | ✗                                       | 409.5                          | 3.3                                    | 69                     | 76                       | 60                                | 18.8            | 3                                | 51                | 144.7                        |
| Lamar      | 103                           | 37.6            | 413.3                        | ✗               | ✓                                       | 430.5                          | -4.0                                   | 50                     | 53                       | 69                                | 25.2            | 6                                | 60                | 240.1                        |
| Lauderdale | 397                           | 44.6            | 458.1                        | ✗               | ✗                                       | 446.9                          | 2.5                                    | 170                    | 227                      | 182                               | 20.4            | 13                               | 180               | 218.6                        |
| Lawrence   | 72                            | 47.7            | 459.8                        | ✗               | ✗                                       | 483.5                          | -4.9                                   | 33                     | 39                       | 28                                | 18.5            | 0                                | 39                | 217.1                        |
| Leake      | 119                           | 47.2            | 510.8                        | ✗               | ✗                                       | 453.9                          | 12.5                                   | 54                     | 65                       | 48                                | 19.0            | 5                                | 31                | 150.0                        |

| County       | Cardiovascular Disease Deaths |                 |                              |                 |   |                                |  | Cancer Deaths          |                          |                                   |                 | CHD Deaths                       |                   |                              |
|--------------|-------------------------------|-----------------|------------------------------|-----------------|---|--------------------------------|--|------------------------|--------------------------|-----------------------------------|-----------------|----------------------------------|-------------------|------------------------------|
|              | No. of CVD deaths             | % of all deaths | Age-adjd. death rate 1996-98 | Rate in top 10? | Stat. signif. different from state rate | Age-adjd. death rate 1993-1995 | % Change in death rate 96-98 vs. 93-95 | No. of CVD deaths Male | No. of CVD deaths Female | No. of deaths all forms of cancer | % of all deaths | No. of deaths from breast cancer | No. of CHD deaths | Age adjd. death rate 1996-98 |
| Lee          | 319                           | 47.5            | 504.3                        | ✗               | ✓                                       | 491.8                          | 2.5                                    | 157                    | 162                      | 131                               | 19.5            | 8                                | 111               | 163.6                        |
| Leflore      | 191                           | 49.6            | 537.3                        | ✗               | ✓                                       | 583.1                          | -7.9                                   | 79                     | 112                      | 73                                | 19.0            | 4                                | 99                | 264.8                        |
| Lincoln      | 153                           | 38.2            | 444.8                        | ✗               | ✗                                       | 443.3                          | 0.4                                    | 60                     | 93                       | 88                                | 21.9            | 4                                | 43                | 136.6                        |
| Lowndes      | 214                           | 40.7            | 431.7                        | ✗               | ✗                                       | 456.2                          | -5.4                                   | 107                    | 107                      | 109                               | 20.7            | 9                                | 48                | 101.7                        |
| Madison      | 216                           | 41.7            | 367.9                        | ✗               | ✓                                       | 420.0                          | -12.4                                  | 103                    | 113                      | 90                                | 17.4            | 6                                | 61                | 105.7                        |
| Marion       | 118                           | 37.3            | 517.1                        | ✗               | ✓                                       | 553.2                          | -6.5                                   | 52                     | 66                       | 71                                | 22.5            | 4                                | 31                | 149.4                        |
| Marshall     | 118                           | 38.7            | 452.7                        | ✗               | ✗                                       | 437.1                          | 3.6                                    | 60                     | 58                       | 87                                | 28.5            | 5                                | 50                | 203.4                        |
| Monroe       | 163                           | 40.3            | 426.8                        | ✗               | ✗                                       | 451.1                          | -5.4                                   | 84                     | 79                       | 91                                | 22.5            | 6                                | 69                | 150.2                        |
| Montgomery   | 68                            | 43.9            | 458.4                        | ✗               | ✗                                       | 437.6                          | 4.8                                    | 29                     | 39                       | 27                                | 17.4            | 2                                | 31                | 223.1                        |
| Neshoba      | 155                           | 46.8            | 482.0                        | ✗               | ✗                                       | 450.3                          | 7.0                                    | 72                     | 83                       | 58                                | 17.5            | 5                                | 62                | 149.9                        |
| Newton       | 100                           | 41.2            | 413.0                        | ✗               | ✓                                       | 505.2                          | -18.3                                  | 47                     | 53                       | 58                                | 23.9            | 4                                | 28                | 125.8                        |
| Noxubee      | 60                            | 49.6            | 474.8                        | ✗               | ✗                                       | 549.3                          | -13.6                                  | 28                     | 32                       | 19                                | 15.7            | 0                                | 39                | 274.8                        |
| Oktibbeha    | 138                           | 48.8            | 436.4                        | ✗               | ✗                                       | 414.7                          | 5.2                                    | 61                     | 77                       | 53                                | 18.7            | 3                                | 24                | 94.5                         |
| Panola       | 173                           | 45.3            | 521.5                        | ✗               | ✓                                       | 452.2                          | 15.3                                   | 85                     | 88                       | 67                                | 17.5            | 3                                | 74                | 238.1                        |
| Pearl River  | 164                           | 35.6            | 417.9                        | ✗               | ✓                                       | 471.1                          | -11.3                                  | 86                     | 78                       | 107                               | 23.2            | 7                                | 87                | 216.7                        |
| Perry        | 52                            | 58.4            | 464.8                        | ✗               | ✗                                       | 515.7                          | -9.9                                   | 25                     | 27                       | 12                                | 13.5            | 2                                | 28                | 218.2                        |
| Pike         | 166                           | 38.1            | 463.9                        | ✗               | ✗                                       | 528.1                          | -12.2                                  | 66                     | 100                      | 81                                | 18.6            | 8                                | 112               | 242.2                        |
| Pontotoc     | 99                            | 40.6            | 404.0                        | ✗               | ✓                                       | 409.5                          | -1.4                                   | 51                     | 48                       | 49                                | 20.1            | 7                                | 41                | 160.5                        |
| Prentiss     | 90                            | 44.6            | 361.4                        | ✗               | ✓                                       | 305.6                          | 18.3                                   | 49                     | 41                       | 37                                | 18.3            | 2                                | 16                | 72.1                         |
| Quitman      | 49                            | 37.1            | 509.9                        | ✗               | ✗                                       | 489.4                          | 4.2                                    | 22                     | 27                       | 31                                | 23.5            | 2                                | 27                | 263.9                        |
| Rankin       | 326                           | 43.1            | 416.7                        | ✗               | ✓                                       | 423.9                          | -1.7                                   | 150                    | 176                      | 155                               | 20.5            | 7                                | 65                | 82.0                         |
| Scott        | 138                           | 43.0            | 452.8                        | ✗               | ✗                                       | 487.3                          | -7.1                                   | 68                     | 70                       | 71                                | 22.1            | 3                                | 72                | 202.7                        |
| Sharkey*     | 36                            | 43.9            | 566.1                        | ✓ (5)           | ✗                                       | 555.4                          | 1.9                                    | 16                     | 20                       | 15                                | 18.3            | 3                                | 14                | 224.3                        |
| Simpson      | 147                           | 46.2            | 512.9                        | ✗               | ✓                                       | 506.1                          | 1.3                                    | 70                     | 77                       | 69                                | 21.7            | 5                                | 77                | 268.2                        |
| Smith        | 72                            | 44.2            | 472.7                        | ✗               | ✗                                       | 436.8                          | 8.2                                    | 35                     | 37                       | 45                                | 27.6            | 2                                | 40                | 230.7                        |
| Stone        | 50                            | 38.2            | 548.3                        | ✗               | ✓                                       | 587.3                          | -6.6                                   | 24                     | 26                       | 29                                | 22.1            | 2                                | 31                | 336.8                        |
| Sunflower    | 153                           | 44.9            | 541.2                        | ✗               | ✓                                       | 591.3                          | -8.5                                   | 71                     | 82                       | 76                                | 22.3            | 8                                | 67                | 247.6                        |
| Tallahatchie | 59                            | 38.8            | 406.4                        | ✗               | ✗                                       | 437.6                          | -7.1                                   | 25                     | 34                       | 35                                | 23.0            | 0                                | 26                | 130.7                        |
| Tate         | 92                            | 42.6            | 429.2                        | ✗               | ✗                                       | 515.2                          | -16.7                                  | 37                     | 55                       | 52                                | 24.1            | 3                                | 30                | 128.4                        |
| Tippah       | 115                           | 44.9            | 456.0                        | ✗               | ✗                                       | 520.7                          | -12.4                                  | 57                     | 58                       | 53                                | 20.7            | 1                                | 70                | 273.0                        |
| Tishomingo   | 121                           | 43.1            | 477.7                        | ✗               | ✗                                       | 471.9                          | 1.2                                    | 51                     | 70                       | 74                                | 26.3            | 4                                | 72                | 219.4                        |
| Tunica       | 27                            | 30.0            | 638.7                        | ✓ (2)           | ✓                                       | 615.6                          | 3.8                                    | 7                      | 20                       | 27                                | 30.0            | 1                                | 15                | 370.2                        |
| Union        | 107                           | 40.7            | 401.5                        | ✗               | ✓                                       | 447.4                          | -10.3                                  | 45                     | 62                       | 60                                | 22.8            | 4                                | 42                | 142.6                        |
| Walthall     | 74                            | 43.3            | 491.5                        | ✗               | ✗                                       | 500.2                          | -1.7                                   | 33                     | 41                       | 31                                | 18.1            | 3                                | 31                | 176.7                        |
| Warren       | 227                           | 44.2            | 509.1                        | ✗               | ✓                                       | 523.5                          | -2.8                                   | 112                    | 115                      | 110                               | 21.4            | 4                                | 100               | 228.6                        |
| Washington   | 317                           | 45.5            | 569.6                        | ✓ (4)           | ✓                                       | 598.1                          | -4.8                                   | 160                    | 157                      | 121                               | 17.4            | 8                                | 172               | 293.0                        |
| Wayne        | 84                            | 39.6            | 503.3                        | ✗               | ✗                                       | 500.8                          | 0.5                                    | 39                     | 45                       | 40                                | 18.9            | 3                                | 34                | 205.7                        |
| Webster      | 57                            | 42.9            | 432.0                        | ✗               | ✗                                       | 417.1                          | 3.6                                    | 24                     | 33                       | 25                                | 18.8            | 1                                | 16                | 131.7                        |
| Wilkinson    | 50                            | 41.3            | 521.6                        | ✗               | ✗                                       | 542.1                          | -3.8                                   | 29                     | 21                       | 31                                | 25.6            | 4                                | 28                | 239.8                        |
| Winston      | 117                           | 53.7            | 478.3                        | ✗               | ✗                                       | 520.8                          | -8.2                                   | 50                     | 67                       | 40                                | 18.3            | 3                                | 26                | 96.7                         |
| Yalobusha    | 70                            | 38.0            | 445.1                        | ✗               | ✗                                       | 535.6                          | -16.9                                  | 37                     | 33                       | 51                                | 27.7            | 0                                | 32                | 208.5                        |
| Yazoo        | 124                           | 40.9            | 473.4                        | ✗               | ✗                                       | 531.7                          | -11.0                                  | 60                     | 64                       | 55                                | 18.2            | 2                                | 53                | 202.1                        |

\*Note: the rate for Sharkey county is high but not statistically significantly different from the state rate due to the small number of deaths.

# Comparison Between CVD Deaths And Breast Cancer Deaths In Women

Many women fear breast cancer, though for the average woman with no family history and no recognized predisposing risk factors for breast cancer the risk of dying from CVD is much greater, particularly after menopause. Some numbers help to put this in perspective: before the menopause, a woman has a slightly greater chance of dying of breast cancer than of CVD, though the risk

of either is small. After the menopause a woman *always* has a greater chance of dying of CVD than of breast cancer; this is particularly true for elderly women (Table 3).

In Mississippi in 1998, there were 6,279 CVD deaths among women compared to 396 breast cancer deaths (Table 2).

**Table 3 - Chances Of A Woman Dying Of Breast Cancer And CVD At Different Ages.**

| Age Group                      | Chance Of Dying From Breast Cancer | Chance Of Dying From CVD |
|--------------------------------|------------------------------------|--------------------------|
| During Her Thirties            | 0                                  | 0                        |
| During Her Forties             | 1 in 328                           | 1 in 492                 |
| During Her Fifties             | 1 in 161                           | 1 in 138                 |
| During Her Sixties             | 1 in 133                           | 1 in 37                  |
| During Her Seventies           | 1 in 76                            | 1 in 11                  |
| During Her Eighties & Nineties | 1 in 48                            | 1 in 2                   |

*CVD = cardiovascular disease*

Source: Phillips K-A, Glendon G, Knight JA. Putting the risk of breast cancer in perspective. *New England Journal of medicine* 1999;340:141-144.

# Risk Factors For Cardiovascular Disease And Coronary Heart Disease

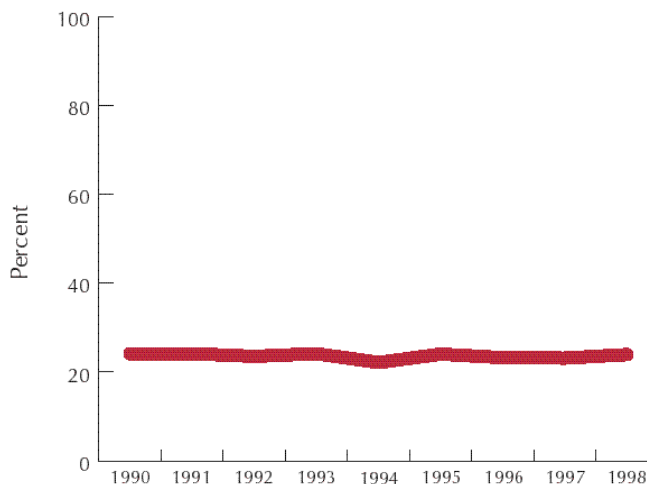
By definition, a risk factor for CVD/CHD is a condition or behavior that increases a person's risk of developing CVD/CHD; the risk factor is often directly involved in causing the CVD/CHD, though this is not always necessary. Some risk factors are "modifiable": in other words, the risk factor can be controlled or reduced, and the risk of developing CVD/CHD lessened. Risk factors for CVD/CHD that cannot be changed are age (CVD/CHD mortality rates increase as age increases), gender (males have higher CVD/CHD mortality rates than women, especially before the menopause), race (African Americans generally have higher rates than whites), family history of CHD at an early age, and previous medical history of CVD/CHD. The main modifiable risk factors are smoking, high blood pressure,

high blood cholesterol levels, being overweight/obese, lack of regular physical activity, and diabetes. Prevalence data on these are available for Mississippi since 1990. For several risk factors (e.g., overweight/obesity and diabetes), Mississippi has one of the highest prevalence rates in the nation.

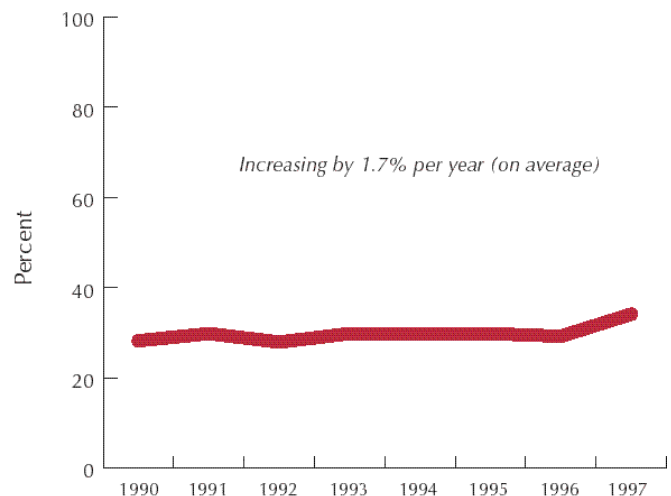
## Smoking

Smoking is the single most important modifiable risk factor for CVD/CHD. Approximately one quarter (24%) of adult Mississippians are current smokers. This figure has stayed virtually constant since 1990 (Figure 12). Although this percentage has decreased considerably since the 1940s and 1950s, when 50-60% of adults smoked, further improvements may be difficult to achieve.

**Figure 13 - Prevalence Of Cigarette Smoking Mississippi, 1990-98**



**Figure 14 - Prevalence Of Hypertension Mississippi, 1990-97**



Interventions to increase quitting rates are important, though this group probably includes 'hard-core' smokers who are more resistant to quitting. Even more important are interventions to reduce smoking initiation rates in young people: smoking rates in teenagers are actually increasing, especially in adolescent females and young women.

### High Blood Pressure (Hypertension)

Between 1990 and 1996, the percentage of adult Mississippians with hypertension remained fairly constant at 28-30%. In 1997, this figure jumped to 34% (Figure 14). Approximately 900,000 adults in the state are estimated to have hypertension; one third of these (300,000) have not been diagnosed.

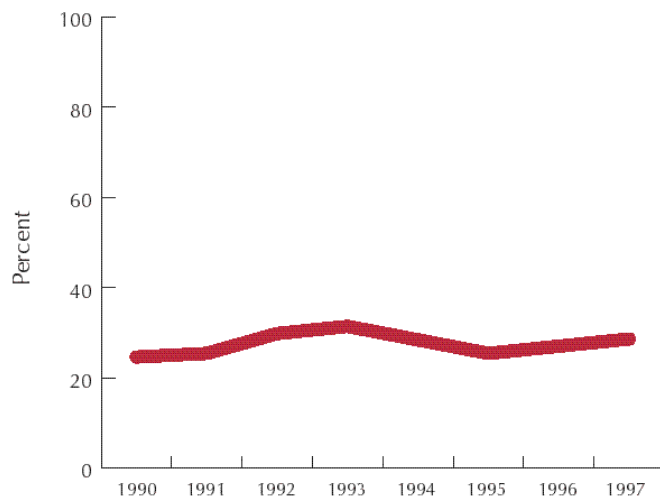
Of the 600,000 with diagnosed hypertension, it is estimated that half are not on treatment, for various reasons. Hypertension is a major risk factor for both CHD and stroke, and the high (and rising) prevalence is very likely an important reason for the high CHD and stroke mortality rates in the state.

Mississippi is one of eleven states in the southeast region of the U.S. known as the 'Stroke Belt'; this region has for at least 50 years had higher stroke death rates than other U.S. regions.

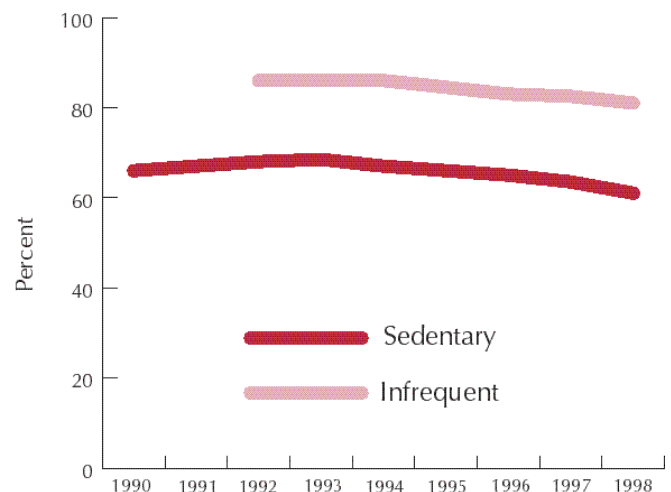
### High Blood Cholesterol Levels

The percentage of adult Mississippians reporting a high blood cholesterol level has changed little since 1990 and currently stands at about 29% (Figure 15).

**Figure 15 - Prevalence Of High Cholesterol Mississippi, 1990-97**



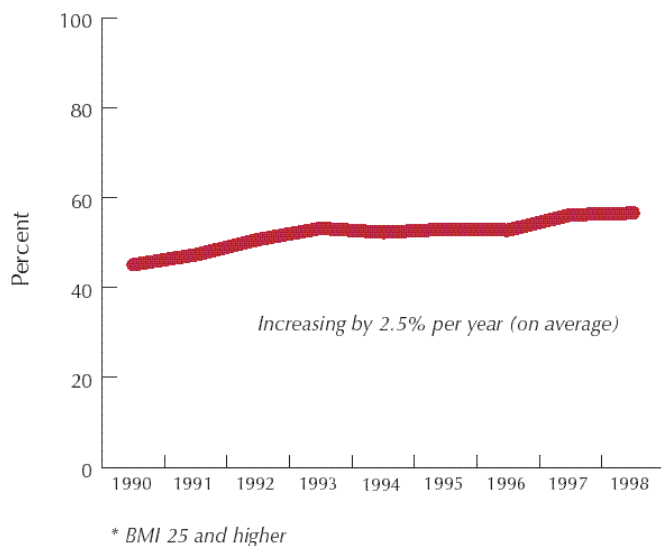
**Figure 16 - Prevalence Of Sedentary Lifestyle And Lack Of Exercise, Mississippi, 1990-98**



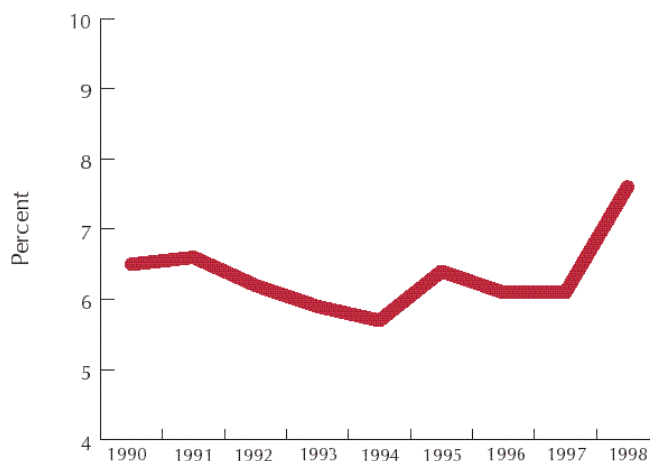
*Infrequent = Report lack of frequent, regular exercise  
(at least 5 days per week,  
at least 30 minutes per session)*

*Sedentary = Report sedentary lifestyle  
(sedentary or irregular physical activity profile)*

**Figure 17 - Combined Prevalence\*  
Of Adult Overweight And Obesity  
Mississippi, 1990-98**



**Figure 18 - Prevalence Of Diabetes  
Mississippi, 1990-98**



### **Lack Of Regular Physical Activity**

Four out of five (81%) adult Mississippians are not physically active on a regular basis (at least 5 days per week, at least 30 minutes per session). Three out of five (61%) are sedentary (are physically inactive or are active on an irregular basis only). These figures have changed little since 1990, though there has been a slight improvement in recent years (Figure 16). More and more studies are showing the many benefits of regular, moderate physical activity. Moderate activity includes brisk walking, yard work, and so on; intense aerobic exercise in a gym is not necessary to achieve health benefits.

### **Being Overweight/Obese**

In 1998, on the basis of new data associating overweight with mortality, the NIH/NHLBI changed the definition of overweight to include all persons with a body mass index (BMI) equal to or greater than 25. Mortality is 10-25% higher for persons with a BMI between 25 and 30, and 50-100% higher for persons with a BMI of 30 or more. The percentage of adult Mississippians with a BMI equal to or greater than 25 has increased steadily since 1990 by about 2.5% per year on average; currently 57% of adult Mississippians are overweight (Figure 17).

**Table 4 - The Number And Percentage of Mississippians With Modifiable Risk Factors\* For CVD, 1997-98**

| Number Of Risk Factors | Number Of Adult ** Mississippians | Percent Of Adult** Mississippians | Comments                          |
|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 0                      | 484,802                           | 24.7                              | —                                 |
| 1                      | 796,888                           | 40.6                              | 75.3% have 1 or more risk factors |
| 2                      | 563,270                           | 28.7                              | 34.7% have 2 or more risk factors |
| 3                      | 112,708                           | 5.7                               | 6.0% have 3 or more risk factors  |
| 4                      | 4,974                             | 0.3                               | 0.3% have 4 or more risk factors  |
| 5                      | 0                                 | 0                                 | —                                 |

\* modifiable risk factors include smoking, high blood pressure, high cholesterol, sedentary lifestyle, and being overweight/obese

\*\* 18 years of age or older

## Clustering Of CVD/CHD Risk Factors

Three-quarters of adult Mississippians have at least one of the five main CVD/CHD risk factors. Risk factors for CVD/CHD may cluster in some individuals; one third have at least two factors (Table 4). Most people, however, have only one or two factors (Table 4).

## Diabetes Mellitus

Diabetes is now recognized as a major, independent risk factor for

CVD/CHD. Between 1990 and 1996, the percentage of adult Mississippians with diabetes remained fairly constant at around 6%. In 1997, this figure jumped to 7.6% (Figure 18). Approximately 225,000 adults in the state are estimated to have diabetes; one third of these (75,000) have not been diagnosed. More than 700,000 are at risk of developing it in the future, because they are overweight and/or physically inactive.

# Summary And Conclusions

This report summarizes the most recent information available on CVD, CHD, and associated health risk behaviors in Mississippi. CVD mortality rates in Mississippi are the highest in the U.S. and are not declining as fast as rates in the rest of the nation. There is a wide variation in mortality rates between counties, and in some counties CVD mortality rates have actually increased. Marked racial disparities exist in the CVD mortality rates, and the disparities are increasing largely because rates in African Americans have leveled off. A considerable amount of CVD mortality is premature, especially in African American men.

Why are CVD death rates high in Mississippi, and why are they not declining as fast as rates elsewhere? This cannot be fully explained. A mortality rate reflects both incidence of disease (the rate of development of new cases) and survival after disease has developed (which in turn reflects the severity of the disease and the effect of treatment). Changes in either or both of these will affect mortality. It is not known whether the high CVD mortality rates in Mississippi are due to high incidence (more new cases of CVD), more severe disease, poorer survival of persons with CVD, or some combination of these factors. CVD mortality rates have been declining in Mississippi and the U.S. for the past 30 years. The decline has occurred in all age and racial/ethnic groups and both genders, and is presumably due, at least in part, to healthier lifestyles, a lower prevalence of CVD risk factors such as smoking and high BP in the population, and improvements in medical care. It has been estimated that more than 70% of

the decline in CHD mortality in the U.S. between 1980 and 1990 resulted from secondary prevention i.e., reduction in risk factors and improvements in treatment in patients with clinical CHD. Primary prevention (i.e., reduction of risk factors before clinical CHD develops) accounted for only 25% of the decline.

Whatever the gaps in our knowledge, it remains clear that further decreases in CVD mortality rates will not be achieved unless racial/ethnic and geographic disparities are reduced. Further work is needed to identify and quantify differences in the availability of, access to, and quality of medical care for persons with CVD, and to identify and (if possible) eliminate any barriers. Studies elsewhere have shown that racial disparities exist in the access to and use of CVD procedures. It is not known whether this is an important factor in Mississippi. Also, primary prevention needs to be emphasized very strongly, to reduce the prevalence of CVD risk factors in the population: more Mississippians need to stop smoking, become more active, lose weight, control their blood pressure, eat a healthier diet, and lower their blood cholesterol level. This prevention must start at an early age, since the processes that lead to CVD in middle or old age begin in childhood.

Much of the death, illness, and disability due to CVD is preventable, but it will not be prevented without population-wide actions by individuals, schools, communities, and workplaces working together to create 'heart-healthy' environments, policies, and norms.

# Appendix — Methods, Definitions, And Abbreviations

## Methods

CVD and CHD mortality numbers and rates for 1993-98 are based on death certificate data provided by the Bureau of Public Health Statistics, Mississippi State Department of Health (MSDH). CVD and CHD mortality rates for 1980-97 were obtained from the National Center for Health Statistics (NCHS) via CDCs WONDER system at <http://wonder.cdc.gov>. The most recent year for which the U.S. CVD and CHD mortality rates were available was 1997. The following ICD-9 codes were used: CVD: 390-448; CHD: 410-414; Stroke: 430-438; Cancer: 140-208; Female breast cancer: 174; Injuries: E800-E999; Chronic lung disease: 490-496; Pneumonia/Influenza: 480-487; Diabetes: 250.

Crude mortality rates are calculated using number of deaths as the numerator and the most recent mid-year population estimates for the state from the U.S. Census Bureau ([www.census.gov](http://www.census.gov)) as the denominator. Crude rates are age adjusted by the direct method using the projected 2000 U.S. population as the standard. The estimated annual percent change (EAPC) in rates, referred to in this report as the average change per year, was calculated by fitting a regression line to the natural logarithm ( $\ln$ ) of the rates ( $r$ ) using calendar year as a regressor variable, i.e.  $y = mx + b$  where  $y = \ln r$  and  $x = \text{calendar year}$ . The  $EAPC = 100(e^m - 1)$ . This calculation assumes that the rates changed at a constant rate over the entire time interval.

In Table 2, county rates are compared to the state rate using a z-test with a significance level of 0.05. The source of the formula for the test and the standard error of an age adjusted rate was the NCHS, CDC (Monthly Vital Statistics Report, volume 45, number 11(S)2, June 12, 1997, p.77).

Risk factor estimates are based on self-reported data from the Mississippi Behavioral Risk Factor Surveillance System (MS-BRFSS). The MS-BRFSS is a continuous, statewide, random-digit-dialed telephone survey of a representative sample of the Mississippi civilian non-institutionalized adult population (18 years of age and older). The overall sample size for 1990-97 varied between 1,578 and 1,599 persons; in 1998, the sample was increased to 2,307 persons. The MS-BRFSS collects data on a number of health risk behaviors, including smoking, high blood pressure, high blood cholesterol, diabetes, and physical activity/exercise patterns. Respondents are also asked to report weight and height, from which body mass index (BMI) can be calculated.

## Note On Race Categories

The two categories of race used in this report are “white” and “African American”. In Mississippi, the population distribution by race is approximately 63% white, 36% African American, and 1% other races (largely Asian/Pacific Islander and American Indian). The number of persons in the “other” race category is too small for a separate analysis.

## Definitions

- *Age adjusted death rate*: a crude death rate that has been adjusted statistically (standardized to a reference population) to allow comparisons of rates from different time periods, places, or populations.
- *Incidence*: the number (expressed as a rate) of new cases of a disease in a population.
- *Prevalence*: the number (expressed as proportion or percentage) of existing cases of a disease or risk factor in a population at a specific point in time.
- *Current smoking*: defined as having smoked at least 100 cigarettes in one's lifetime and smoking now (every day or only some days).
- *High blood pressure*: defined as having been told by a health professional that one's blood pressure was high.
- *High blood cholesterol level*: defined as having been told by a health professional that one's blood cholesterol level was high (among persons who have ever had a blood cholesterol test).
- *Overweight/obesity*: defined as having a body mass index (BMI) equal to or greater than 25.0 kg/m<sup>2</sup>. Using weight in kilograms and height in meters, BMI equals

weight divided by the square of the height. Using weight in pounds and height in inches, BMI equals weight multiplied by 705 and divided by the square of the height.

- *Sedentary lifestyle and lack of exercise*: Lack of frequent, regular exercise is defined as not exercising at least 5 days per week, at least 30 minutes per session. Sedentary lifestyle is defined as being physically inactive or active on an irregular basis only.
- *Diabetes*: defined as having been told by a health professional that one has diabetes.

## Abbreviations

- CVD = cardiovascular disease
- CHD = coronary heart disease (also known as ischemic heart disease, IHD)
- ICD-9: International Classification of Diseases, 9th Revision
- MSDH = Mississippi State Department of Health
- CDC = Centers for Disease Control and Prevention
- NCHS = National Center for Health Statistics
- NIH/NHLBI = National Institute of Health/National Heart, Lung, and Blood Institute

# Tips For A Healthy Heart

The American Heart Association offers these tips for maintaining good cardiovascular health —



- Avoid tobacco smoke
- Eat foods low in saturated fat, cholesterol and sodium
- Know and control your blood pressure and cholesterol levels
- Be active

## Reduce Your Risk For Heart Disease And Stroke

- **Don't smoke cigarettes.** Tobacco use is the number one preventable cause of heart disease in the U.S. Tobacco makes your blood clot easier, stiffens the walls of your arteries, and deprives your heart of needed oxygen. The message is simple: If you use tobacco, stop; if you don't use tobacco, don't start.
- **Stay active.** Moderate physical activity (such as walking, work, climbing stairs) for a total of 30 minutes a day most days a week helps keep your weight down, allows your body to get rid of "bad" cholesterol, and can help keep your blood pressure under control. Recent research shows that you don't have to do your daily allotment of physical activity at once. Ten or fifteen minutes at a time will do the trick, as long as it adds up to at least 30 minutes most days of the week. It's really simple: just make physical activity a regular part of your life.
- **Eat less fat.** Dietary fats, especially animal fats, pose another big threat to your heart. The American Heart Association recommends that you keep your fat intake to less than 30% of total calories, including no more than 10% of calories from animal or saturated fats. Use the FDA "Nutrition Facts" on food labels to help you cut down on your fat intake. The American Heart Association also has free dietary recommendations.
- **Check your blood pressure.** Uncontrolled high blood pressure is a leading risk factor for stroke, which is like a heart attack, only in the brain. Stroke is a leading cause of disability and the third leading cause of death. If your blood pressure is normal, get it checked at least every two years.

If your blood pressure is 130/85 or over, consult a physician. He or she can help you get it under control.
- **Check your cholesterol level.** If your cholesterol is normal (less than 200), get it checked every five years. If it's high, see your doctor about getting it under control. Eating foods that contain no cholesterol, such as fruits and vegetables, and staying physically active are two easy ways to keep your cholesterol low.
- **Recognize and treat diabetes.** Having diabetes (high blood sugar) can seriously increase your risk of stroke and heart disease. If you have diabetes, you can prevent or delay heart disease by controlling your weight, cholesterol, and blood pressure.
- **Know your family's heart history.** Heart disease often runs in families. If your family has a history of heart disease, you may be at increased risk. If so, don't despair. You can readily reduce that risk by taking action now with the above steps. Your family will thank you for it.